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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,339	09/07/2006	Graham Goodwin	14269-105007	4828
65989	7590	09/16/2008	EXAMINER	
KING & SPALDING 1185 AVENUE OF THE AMERICAS NEW YORK, NY 10036-4003			LIAO, DIANA J	
ART UNIT	PAPER NUMBER			
	1793			
NOTIFICATION DATE	DELIVERY MODE			
09/16/2008	ELECTRONIC			

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomailnyc@kslaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/587,339	<b>Applicant(s)</b> GOODWIN ET AL.
	<b>Examiner</b> DIANA J. LIAO	<b>Art Unit</b> 1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(o).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
  - 4a) Of the above claim(s) 14 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-13 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08) \_\_\_\_\_  
 Paper No(s)/Mail Date 7/26/2006
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Acknowledgement of Provisional Election***

1. During a telephone conversation with a representative on behalf of Ms. Brivanlou on 9/2/08 a provisional election was made without traverse to prosecute the invention of group I, claims 1-13. Affirmation of this election must be made by applicant in replying to this Office action. Claim 14 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Election/Restrictions***

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-13, drawn to a composition.

Group II, claim(s) 14, drawn to a method of making.

3. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The requirements for a special technical feature are outlined in Annex B of Appendix A1 of the MPEP (Administrative Instructions under the PCT, "Unity of Invention"). Unity exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding claimed technical features. The express "special technical features" is defined as meaning those technical features that define a contribution which each of the inventions, considered as a whole, makes over the prior art."(Rule 13.2).

The question of unity of invention has been reconsidered retroactively by the examiner in view of the search performed; a review of the prior art (Okusako 2002/0077251)

Art Unit: 1793

appears to demonstrate that the claimed coating composition does not define a contribution which each of the inventions, considered as a whole, makes over the prior art. Accordingly, the prior art of the record supports restriction of the claimed subject matter in to the groups as mentioned immediately above.

Okusako '251 teaches a photocatalytic composition suitable to be used as a coating, containing photocatalytic particles and basic metal-containing compounds (found to be equivalent to particles having a de-HNO<sub>3</sub> activity). (claim 16) The use of a silicon-containing compound in a coating composition is well known in the art since binders are commonly used, especially silicon-containing binders. Therefore, the common technical feature is not expected to overcome the prior art and there is a lack of unity.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5. The examiner has required restriction between product and process claims.

Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product

Art Unit: 1793

are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

***Information Disclosure Statement***

6. The information disclosure statement (IDS) submitted on 7/26/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites in component c "a silicon based-material in which said *particles* are dispersed". The term "particles" can either refer to titanium dioxide particles, de-  
HNO<sub>3</sub> particles, or both sets of particles. Clarification is required.

9. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites that "the silicon based-material *provides* a polysiloxane film". It is unclear if the film's existence is a positive limitation that is being claimed as part of the composition, or if the silicon based-material need only be capable of forming a polysiloxane film as an intended use.

10. Claims 4, 6, 9, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a

question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 4 recites the broad recitation "mean size of 1 to 50 nm", and the claim also recites "in particular from 2 to 30 nm, more particularly 5 to 20 nm" which is the narrower statement of the range/limitation.

Claim 6 recites the broad recitation "an amount of 0.1 to 15%", and the claim also recites "preferably 1 to 13% and most preferably 2 to 10%" which is the narrower statement of the range/limitation.

Claim 9 recites the broad recitation "an amount of 0.05 to 15%", and the claim also recites "in particular of 0.1 to 1%" which is the narrower statement of the range/limitation.

Claim 10 recites the broad recitation "ranging from 0.05 to 1.2", and the claim also recites "in particular from 0.1 to 1, and more particularly from 0.2 to 0.8" which is the narrower statement of the range/limitation.

#### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okusako, et al. (US 2002/0077251) in view of EP 1118385.

Okusako '251 teaches the creation of a photocatalytic composition comprising anatase titanium dioxide and a metal-containing compound. The anatase crystalline size is of about 10 nm or larger. The photocatalyst has a surface area of at least 55 m<sup>2</sup>/g. (claim 1) The metal-containing compound may be a basic compound, such as a carbonate of zinc or an alkaline-earth metal. (claim 8) The composition may also be present as a coating when combined with a solvent. (claim 16) The metal-containing compound may be present in a variety of configurations, in an amount of at least 0.05% by mole based on the amount of titanium. However, when the metal-containing compound is present in excess, the photocatalytic activity becomes lowered. (para 25) The basic compounds are able to decompose compounds such as hydrogen sulfide or acetic acid. (para 26) The composition can be used for NOx applications. (para 44)

Regarding particles having a de-HNO<sub>3</sub> activity, Okusako '251 teaches the inclusion of a metal-containing compound which fits those denoted in instant claim 8. In addition, Okusako '251 teaches that the basic metal-containing compound can decompose compounds like hydrogen sulfide or acetic acid, which are acidic compounds. This suggests that HNO<sub>3</sub>, nitric acid, would also be decomposed. Thus the basic metal-containing compound inherently possesses a de-HNO<sub>3</sub> property.

Regarding the amount of particles having de-HNO<sub>3</sub> activity in the composition, Okusako '251 appears to teach an overlapping range for the amount of metal-containing compound in the composition, creating a *prima facie* case of obviousness. In addition, Okasako '251 teaches that an excessive amount will decrease catalytic activity. Therefore, due to overlapping ranges, and routine optimization, the amount of de-HNO<sub>3</sub> particles in the composition is not found patentable over the prior art.

Regarding the crystalline and particle size of the photocatalytic particles, Okusako '251 teaches a range for the crystalline size which overlaps with that of the claimed range. The crystalline size and particle size are interpreted to be interchangeable. Therefore, the range taught in Okusako '251 of at least 10nm is found to also overlap the ranges of the claimed photocatalytic particle size.

Okusako '251 does not teach the "particle size" of the photocatalytic particles or a silicon containing compound. Okusako '251 also does not teach the concentration of photocatalytic and de-HNO<sub>3</sub> particles in the coating composition.

EP '385 teaches the creation of a composition possessing photocatalytic activity which can be used, for example, in the purification of harmful gases. (col 1, lines 7-13) The coating composition comprises a photocatalytic metal oxide, at least one member selected from a group comprising silicon resin and precursors, and a solvent. (col 7, lines 50-56) The silicone resin, and similar materials, is meant in this composition as a binder. The binder is added to more strongly affix the coating to a given substrate. (col 5, lines 1-3) A preferred silicone precursor is a siloxane. (col 8, lines 34-50) The specific teachings of several polysiloxanes (col 9, lines 15-30) and the teaching of a resin, which is a polymer, is found to meet the limitation of a polysiloxane film or a polysiloxane polymer. The photocatalytic metal oxide is to be present in the coating composition from 0.001-35 wt.% or more preferably 0.1-10 wt %. (col 5, lines 44-54) EP '385 also teaches the photocatalytic particles to have a crystallite diameter of under 100nm, 20nm or most preferably 10nm. Sizes in this range allow for satisfactory hydrophilification and transparency. The transparency is effected by the lack of significant scattering caused by the particles. (col 8, lines 1-12)

Regarding the silicon-containing compound, one would be motivated to incorporate the silicon-containing binder compound as taught in EP '385 into the coating composition taught in Okusako '251 in order to create a better adhesion onto the substrate the coating is applied to.

Regarding the particle size of the photocatalytic particles, in the event that the crystalline size is not analogous with the particle size, EP '385 fairly suggests the

existence of discrete photocatalytic particles overlapping with that of the claimed size range. EP '385 also teaches that there is reason to optimize the size of the particles to facilitate imparting hydrophilicity and also to keep the coating transparent. Thus due to overlapping ranges, and reason to optimize, the size of the particles is not found patentable over the prior art.

Regarding the amount of photocatalytic particles and de-HNO<sub>3</sub> particles in the composition, EP '385 teaches that photocatalytic particles are 0.001-35 wt.% or preferably 0.1-10 wt.% of the composition, which overlaps with the ranges of the instant claims. Although the relationship of de-HNO<sub>3</sub> wt.% and the total composition is not specifically taught, the relationship between de-HNO<sub>3</sub> content and photocatalytic particles is taught. In addition, Okusako '251 teaches guidelines to optimize the amount of basic metal-containing compounds based on catalytic activity. Therefore it would have been obvious to optimize the amount of de-HNO<sub>3</sub> particles in the composition to provide the most effective photocatalytic coating.

Therefore, since one of ordinary skill in the art would have been motivated to add a silicon-containing compounds such as the binders taught in EP '385 into the coating composition taught in Okusako '251, and due to overlapping ranges and optimization, claims 1-13 are not found patentable over the prior art.

### ***Conclusion***

Claims 1-13 have been rejected. No claims have been allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIANA J. LIAO whose telephone number is (571)270-3592. The examiner can normally be reached on Monday - Friday 8:00am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/  
Primary Examiner, Art Unit 1793

DJL